



U.S. Fish & Wildlife Service

# Hakalau Forest National Wildlife Refuge

Planning Update 3, August 2010



Hawai'i 'ākepa / © jackjeffreyphoto.com

## Refuge Releases Draft CCP/EA

The Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) for the Hakalau Forest and Kona Forest Units of Hakalau Forest National Wildlife Refuge (Refuge) is available for public review and comment.

We want to thank all those who have been involved in our planning so far. In this update, we present three management scenarios (alternatives) being considered for the future of Hakalau Forest Refuge. These draft alternatives are designed to meet Refuge purposes and the

mission of the National Wildlife Refuge System. Alternative B is the preferred alternative.

We are including revised versions of the Refuge's management goals, a summary of each alternative, and a detailed comparison of the alternatives in this update.

Between August 16 and September 15, 2010, interested citizens, agencies, and organizations will have a chance to review and comment on this Draft CCP/EA. Your thoughts and comments are important to us. We will be hosting a public

open house meeting (check our website for details) where printed copies as well as CDs of the document will be available. Refuge staff will be on-hand to answer any questions. Please see page 12 for ways in which to submit your comments.

The document will also be made available at <http://www.fws.gov/hakalauforest/planning.html>, and printed copies and CDs can be requested at the Refuge office. At the end of the comment period, the planning team will evaluate your comments and consider their incorporation into the final CCP. The final CCP will guide management of Hakalau Forest NWR over the next 15 years. Actions will be implemented as funding becomes available.

*Jim Kraus, Refuge Manager*

### What's Next? Upcoming Milestones

Public Review of Draft CCP; Planning Update #3 .....	August/September 2010
Public Open House Meeting for the Draft CCP/EA .....	August/September 2010
Response to public comments on Draft CCP .....	Fall 2010
Distribution of the Final CCP; final planning update .....	Winter 2011

## Wildlife and Habitat Goals

**Goal 1.** Protect, maintain, and restore sub-tropical rainforest community on the leeward slope of Mauna Loa as habitat for all life-history needs to promote the recovery of endangered species (e.g., forest birds, ‘ōpe‘ape‘a, plants, and invertebrates).

**Goal 2.** Protect and maintain lava tube and lava tube skylight habitat throughout the Kona Forest Unit, with special emphasis on their unique and endemic flora and fauna.

**Goal 3.** Protect, maintain, and restore sub-tropical rainforest community on the windward slope of Mauna Kea as habitat for all life-history needs of endangered species (e.g., forest birds, ‘ōpe‘ape‘a, plants, and invertebrates).

**Goal 4.** Protect and maintain wetland and aquatic habitats (e.g., streams and their associated riparian corridors, ponds, and bogs) on the Hakalau Forest Unit.

**Goal 5.** Protect and maintain grassland habitat to support nēnē population recovery.

**Goal 6.** Collect scientific information (inventories, monitoring, research, assessments) necessary to support adaptive management decisions on both units of the Hakalau Forest NWR.

## Draft CCP Alternatives

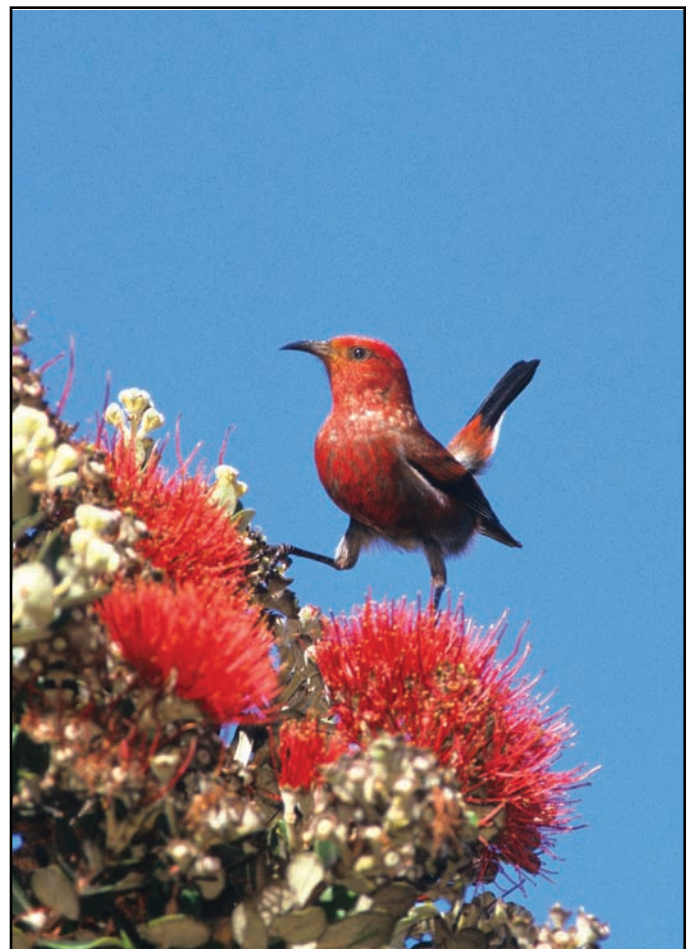
**Alternative A** is the no-action alternative. Existing Refuge management activities would continue, including fencing projects that have been initiated at the Kona Forest Unit. Staff would conduct limited additional restoration of various koa forest habitats. Volunteer opportunities to assist Refuge staff with planting native plants and other public use opportunities would continue. Refuge staff would provide limited outreach regarding management activities.

**Alternative B** is the preferred alternative. Refuge staff would increase reforestation, restoration, and ungulate removal efforts. Additional areas in both units would be protected through fencing and ungulate removal, and increased threatened and endangered plant outplantings and invasive species and predator mammal control would occur. Refuge staff, with the assistance of volunteers, would increase efforts to restore

## Public Use and Cultural Resource Goals

**Goal 7.** Visitors, with a special emphasis on experience gained through volunteer work groups and local residents, understand and/or value the native forest environment and management practices at Hakalau Forest NWR.

**Goal 8.** Protect and manage cultural resources and historic sites for their educational and cultural values for the benefit of present and future generations of Refuge users and communities.



'Apapane / © jackjeffreypphoto.com



## Plan Alternatives...*cont'd*

understory species in reforested areas. Public hunting will be closed. Staff would provide additional opportunities for outreach and environmental education and interpretation. Refuge staff would work with partners and neighboring land owners to explore habitat protection and restoration opportunities, including the potential for Refuge boundary expansion. Opportunities for additional land acquisition would focus on protection of forest birds and their habitats in response to concerns regarding climate change.

**Alternative C** would focus Refuge staff on maintaining existing koa forest and allowing natural regeneration (versus active outplanting) of understory on the Kona Forest Unit. Staff would place less emphasis on ungulate removal and maintenance as well as threatened and endangered plant outplantings and control of invasive species and predator mammal control. Additional grassland areas would be maintained for nēnē foraging. Additional areas of the Hakalau Forest Unit would be opened to the public, however public hunting would be closed. Fewer volunteer opportunities would be provided. As in Alternative B, Refuge staff would explore habitat protection opportunities.

## Actions Common to All Alternatives

All alternatives contain common features. To reduce the length and redundancy of the alternative descriptions, major common features are presented below.

**Invasive Species Control:** The greatest threats to most habitat types on this Refuge are invasive plant and animal species. Therefore, control/eradication of invasive species that negatively impact Refuge wildlife populations or habitats will be a strategy common to all alternatives. The top priorities for control are gorse, banana poka, Himalayan blackberry, and introduced mammalian predators including rats, cats, and mongooses. Invasive plants and animals will be treated with Integrated Pest Management techniques and tools.

**Partnership Opportunities:** The Friends of Hakalau Forest National Wildlife Refuge will continue to be an important partner for Refuge management and outreach. Refuge staff will continue to work with adjacent landowners, such as the Department of Hawaiian Home Lands and Hawai'i Department of Land and Natural Resources (DLNR), for management actions of mutual interest. Refuge staff will continue to work with landscape-level partnerships such as the Three Mountain Alliance and the Mauna Kea Watershed Alliance. Refuge staff will look for other opportunities to develop and enhance partnerships to achieve Refuge goals.

**State and County Coordination:** The Refuge will continue to maintain regular discussions with the DLNR's Division of Forestry and Wildlife. Key topics for discussion with DLNR will be wildlife monitoring, forest bird monitoring and management strategies, invasive species control, threatened and endangered species management, wildlife mortality and disease monitoring, predator management, climate monitoring, public use opportunities, as well as protection of Refuge wildlife and habitat. Hawai'i County will be the primary coordination entity for fire management.

**Volunteer Opportunities:** Volunteer opportunities and partnerships occur in all alternatives. These are recognized as key components of the successful management of public lands and vital to implementation of Refuge programs, plans, and projects, especially in times of declining budgets.

**Fence Construction:** Both Refuge units will be entirely fenced. However, the proposed management actions for both units vary between alternatives.

4 Comparison of Management Alternatives for Hakalau Forest NWR (Major Management Action)			
	Alternative A Current Management	Alternative B Maximize Habitat Restoration – (Preferred Alternative)	Alternative C Maximize Public Use
Habitat and Species Management			
Kona Forest Unit			
Obj. 1.1: Restore and Protect Native Montane Wet ‘Ōhi‘a Forest (2,000-4,500 ft elevation)	1,500 acres. Build and maintain 17-mile ungulate-proof fence. Remove ungulates as well as trespass dogs and cats. Eradicate/control invasive plants.	3,000 acres. In addition to A, conduct annual invasive plant survey and outplant threatened and endangered (T&E) plants in units 2 and 3.	3,000 acres. In addition to A, outplant T&E plants in unit 2.
Obj. 1.2: Restore, Protect, and Maintain Native Montane Mesic Koa/‘Ōhi‘a Forest (4,500-5,800 ft elevation)	900 acres. Build and maintain fence and eradicate/control invasive plants.	1,800 acres. In addition to A, remove ungulates, control predator mammals (e.g., rats, mongooses, cats, dogs), outplant native plants, and conduct annual invasive plant survey.	900 acres. In addition to A, remove ungulates.
Obj. 1.3: Protect, Maintain, and Restore Native Dry Koa/‘Ōhi‘a/Māmane Forest (5,800-6,100 ft elevation)	250 acres. Build and maintain fence, control predator mammals (e.g., rats, mongooses, cats, dogs).	500 acres. In addition to A, remove ungulates, eradicate/control invasive plants, conduct annual invasive plant survey, outplant T&E plants.	250 acres. In addition to A, eradicate/control invasive plants.
Obj. 1.4: Develop and Implement Propagation and Outplanting Program	0 T&E plants annually, 10,000 native plants outplanted.	500 T&E plants annually, 10,000 native plants outplanted. Develop native plant nursery at Mauna Loa field camp site, collect seeds and cuttings, develop (in 7 years) staff, volunteer, and partnering programs.	100 T&E plants annually, 10,000 native plants outplanted. Same as B, but develop staff, volunteer, partnering programs within 12 years (instead of 7).
Obj. 1.5, 5.3: Investigate and Initiate Landscape-level Habitat Conservation Measures	Identify habitats to support focal species; develop protection strategies; develop cooperative agreements with partners and willing seller land acquisition proposals. Includes opportunities to address climate change impacts.	Same as A. In addition, work proactively with partners and willing sellers to protect/restore high quality habitats.	Same as A.

	Alternative A Current Management	Alternative B Maximize Habitat Restoration – (Preferred Alternative)	Alternative C Maximize Public Use
Obj. 2.1: Protect & Maintain Lava Tube and Skylight Communities	Build and maintain fence and develop site specific access protocols to limit human disturbance to habitat.	In addition to A, complete species inventory and GIS location data collection for lava tubes within 5 years. Remove ungulates, control rats and pest plants. Support additional research.	Same as B, but no inventory or mapping.
Hakalau Forest Unit			
Obj. 3.1: Protect and Maintain Native Wet ‘Ōhi’a/Uluhe ( <i>Dicranopteris</i> sp.) Forest (2,500-4,000 ft elevation)	0 acres. Maintain existing activities.	7,000 acres. In addition to A, inventory vegetation, complete Wilderness Study, build site-specific fencing to protect T&E plant populations and <i>Carex</i> sp. bogs.	7,000 acres. Same as A.
Obj. 3.2: Protect and Maintain Native Montane Wet ‘Ōhi’a Forest (4,000-5,000 ft elevation)	1,800 acres. Maintain existing fence, build and maintain fence in units 9, 10, and 11, remove ungulates, control pest plants, control predator mammals (e.g., rats, mongooses, cats, dogs), outplant native overstory koa and ‘ōhi’a, T&E plants, and common understory plants.	8,200 acres. In addition to A, complete Wilderness Study and fence new (larger area) units 9, A, B, and C (rather than units 9, 10, 11).	8,200 acres. Same as A, but fence new (larger area) units 9, A, B, and C (rather than units 9, 10, 11).
Obj. 3.3: Restore, Protect, and Maintain Native Wet Koa/‘Ōhi’a Forest (5,000-6,000 ft elevation)	3,000 acres. Maintain existing fence, build fence along Middle Maulua tract bound- ary, remove ungulates, control pest plants and insects.	5,000 acres. In addition to A, conduct annual invasive plant survey, control predator mam- mals (e.g., rats, mon- gooses, cats, dogs), and outplant T&E plants.	5,000 acres. Same as B, but without the annual inva- sive plant survey.

	Alternative A Current Management	Alternative B Maximize Habitat Restoration – (Preferred Alternative)	Alternative C Maximize Public Use
Obj. 3.4: Protect and Maintain Native Montane Mesic Koa Forest (6,000-6,600 ft elevation)	3,500 acres. Maintain existing fence, remove ungulates, control pest plants and insects, manage wildland fire and hazardous fuels/vegetation, target invasive species that change fire environment, maintain fuel breaks around roadways and building areas.	3,500 acres. In addition to A, control predator mammals (e.g., rats, mongooses, cats, dogs), outplant T&E plants, and establish fire prevention program.	3,500 acres. Same as B, but no fire prevention program established.
Obj. 3.5: Restore/Reforest Native Mesic Koa Forest (6,000-6,600 ft elevation)	1,000 acres. Maintain fence, manage wildland fire and hazardous fuels/vegetation, target invasive species that change fire environment, maintain fuel breaks around roadways and building areas.	2,500 acres. In addition to A, site preparation for plantings (grass control), outplant 300 koa per acre, outplant 150 native understory species and ‘ōhi’a per acre, outplant 100-300 T&E plants, use excluder device to control turkey impact to koa seedlings, control invasive plants, establish fire prevention program.	1,200 acres. Same as B, but exclude fire prevention program, site preparation, 100-300 T&E plants, and excluder device.
Obj. 3.6: Maintain and Enhance Propagation and Outplanting Program	Plant 10,000 koa annually, 8-10,000 natives, 100-300 T&E plantings.	Plant 10,000 koa for 5 years: 5,000 for the next 10 years, 8-10,000 natives, 300-1,200 T&E plantings. Expand native plant nursery at Mauna Kea administration site, collect seeds and cuttings, develop partnerships to assist with propagation program.	Plant 10,000 koa annually, 8-10,000 natives, 100-300 T&E plantings. Same as B, with the exception of developing partnerships to assist with propagation program.

	<b>Alternative A Current Management</b>	<b>Alternative B Maximize Habitat Restoration – (Preferred Alternative)</b>	<b>Alternative C Maximize Public Use</b>
Obj. 4.1: Protect and Maintain Streams and Stream Corridors at HFU	Maintain fencing, control gorse and other invasive plants, remove ungulates.	In addition to A, inventory stream and stream corridors.	Same as A.
Obj. 4.2: Protect and Maintain Seasonal Manmade Ponds and Semipermanent Natural Ponds	Maintain fencing (45 miles).	In addition to A, remove mosquito breeding sites and control invasive plants.	Same as A.
Obj. 4.3: Protect and Maintain <i>Carex</i> Bogs within the Montane Wet 'Ōhi'a/ Uluhe Forest	Status quo.	Install fencing to protect bogs, control invasive plants, survey extent and number of bogs.	Same as A.
Obj. 5.1: Maintain Managed Grassland for Foraging Nēnē	65 acres. Maintain fuel breaks and fence corridors, build and maintain fence, remove ungulates.	65 acres. Same as A.	200 acres. In addition to A, use mowing except during peak nesting (October-April).
Obj. 5.2: Maintain Grassland Habitats for Nēnē Nesting	0 acres. Control predator mammals (e.g., rats, mongooses, cats), maintain fence, remove ungulates.	15 acres. In addition to A, build predator-proof fence on 15-acre grassland breeding site away from administrative site at Pua 'Akala tract.	0 acres. Same as A.
<b>Kona Forest and Hakalau Forest Units</b>			
<b>Survey, Research, Assessments</b>			
Obj. 6.1: Conduct High-Priority Inventory and Monitoring (Survey) Activities that Evaluate Resource Management and Public-Use Activities to Facilitate Adaptive Management	Every 2-4 years as staffing and funding allow, continue existing Refuge inventory and monitoring strategy: conduct annual forest bird transect surveys; conduct feral ungulate and invasive plant species surveys.	Annually, continue existing Refuge inventory and monitoring strategy: conduct annual forest bird transect surveys; conduct feral ungulate, invasive plant species surveys. Develop prioritized list of surveys.	Same as A.
Obj. 6.2: Conduct High-Priority Research Projects that Provide the Best Science for Habitat and Wildlife Management On and Off the Refuge	Review research proposals on a case by case basis.	Develop research priorities and evaluation criteria to review proposals.	Same as A.

**8** *Comparison of Management Alternatives for Hakalau Forest NWR (Major Management Action)*

	<b>Alternative A Current Management</b>	<b>Alternative B Maximize Habitat Restoration – (Preferred Alternative)</b>	<b>Alternative C Maximize Public Use</b>
Obj. 6.3: Conduct Scientific Assessments to Provide Baseline Information to Expand Knowledge Regarding the Status of Refuge Resources to Better Inform Resource Management Decisions	Continue current assessments.	Develop scientific assessment priorities.	Same as A.
<b>Visitors</b>			
Obj. 7.1: Establish Compatible Wildlife Observation and Photography Opportunities	Upper Maulua Tract open weekends via reservation system. Special Use Permits (SUPs) for tours. Annual HFU open house for 500 visitors. KFU closed to public.	In addition to A, develop Upper Maulua Tract interpretive trail (0.3-0.5 mile) and parking area. KFU closed to public.	In addition to B, open Pua ‘Ākala Tract to public; develop wildlife observation platform and boardwalk in the vicinity of Pua ‘Ākala cabin. KFU closed to public.
Obj. 7.2: Promote and Enhance Volunteer Program	Maintain volunteer program and current 35-40 service weekends at HFU.	In addition to A, develop KFU volunteer program similar to HFU.	Maintain volunteer program and decrease service opportunities to 25 weekends at HFU.
Obj. 7.3: Support Existing Outside Programs for On and Off Site Environmental Education and Develop Interpretive Opportunities	Maintain existing environmental education and interpretive programs at current levels, averaging 140 participants annually.	Increase environmental education and interpretive programs (via coordinating more with County, State, and non-governmental organizations and expanding interpretive programs relative to cultural resources/historic sites) to include 168 participants annually	Increase environmental education and interpretive programs to include 200 participants annually (unlike B though, this alternative does not include cultural resources/historic site expansion); advertise and host a monthly on-site environmental education event.

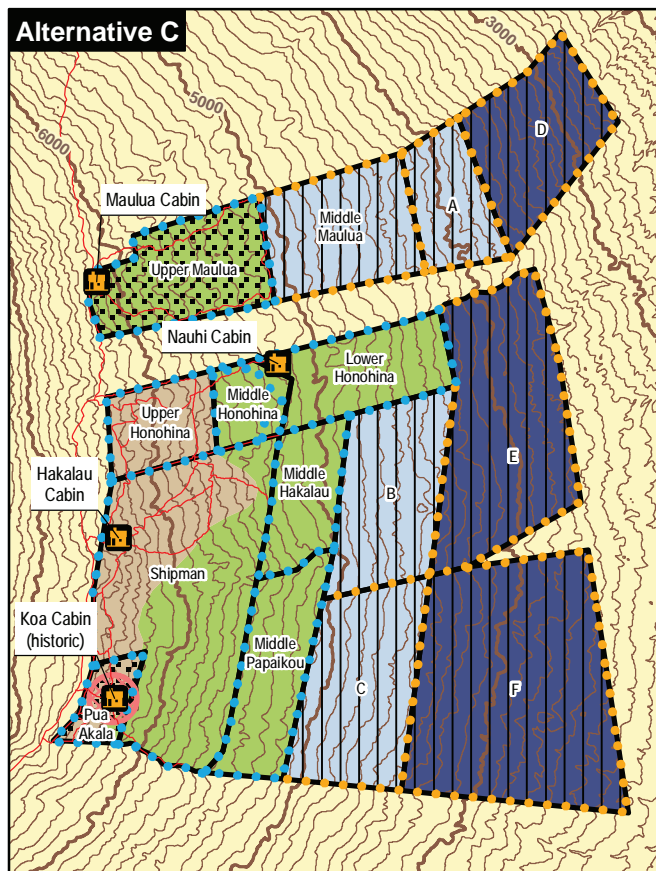
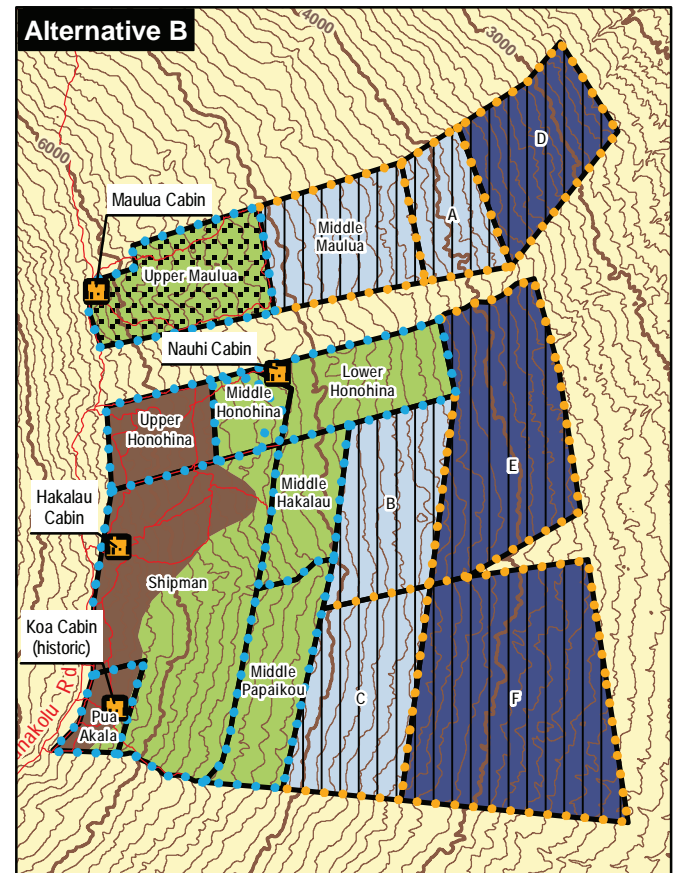
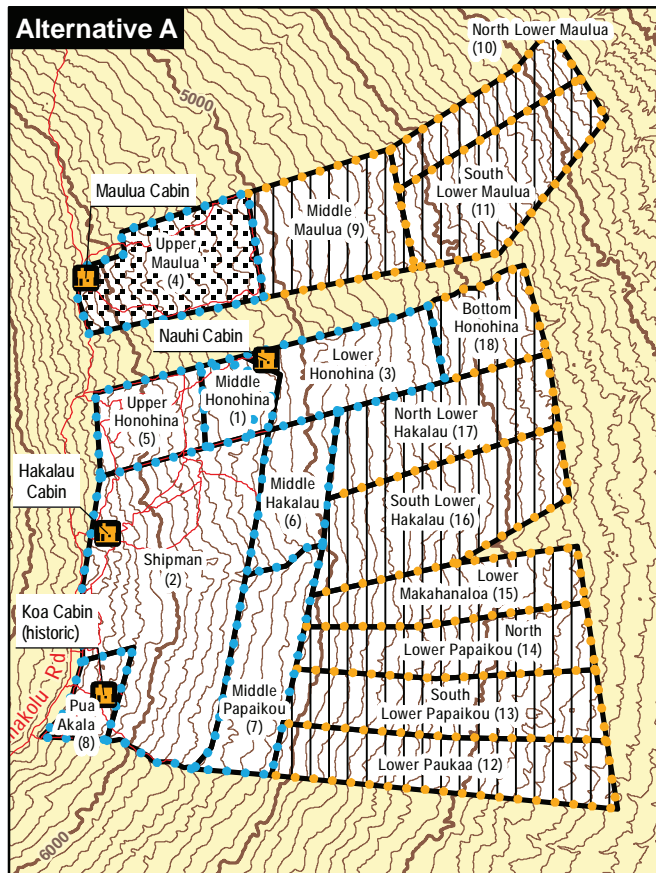


	<b>Alternative A Current Management</b>	<b>Alternative B Maximize Habitat Restoration – (Preferred Alternative)</b>	<b>Alternative C Maximize Public Use</b>
Obj. 7.4: Enhance Outreach Targeting Local Communities to Promote Appreciation of and Generate Support for the KFU	Work with existing partners to promote awareness and appreciation. Continue public hunting at HFU.	In addition to A, develop and cultivate new partners and outreach efforts, discontinue public hunting at HFU.	Same as A, but discontinue public hunting at HFU.
<b>Cultural Resources</b>			
Obj. 8.1: Increase Identification, Monitoring, Protection, and Restoration of all Cultural Resources and Historic Sites, while Increasing Staff and Public Support and Appreciation	Continue cultural/historical resource review when initiating new projects, evaluate known/potential Refuge cultural resources and historic sites, develop guidelines for cultural activities.	In addition to A, identify cultural practitioners to develop understanding of cultural/historical sites at the Refuge, develop interpretive programming and products relative to cultural and historical sites in partnership with Native Hawaiian groups; conduct comprehensive cultural resources investigation of both units.	In addition to A, identify cultural practitioners to develop understanding of cultural/historical sites at the Refuge.



Results of Hakalau Refuge reforestation efforts in 2007 / © jackjeffreypphoto.com





# LEGEND

Existing Management Units

Proposed Management Units

## Management Action

Canopy Restoration

Future Restoration

Natural Restoration

Reforest and Restore

Survey & Monitor

Public Use Area

Approximate Nene Nesting Area

Cabin

Existing Fencing

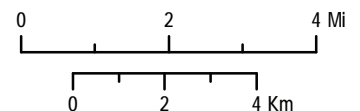
Proposed Fencing

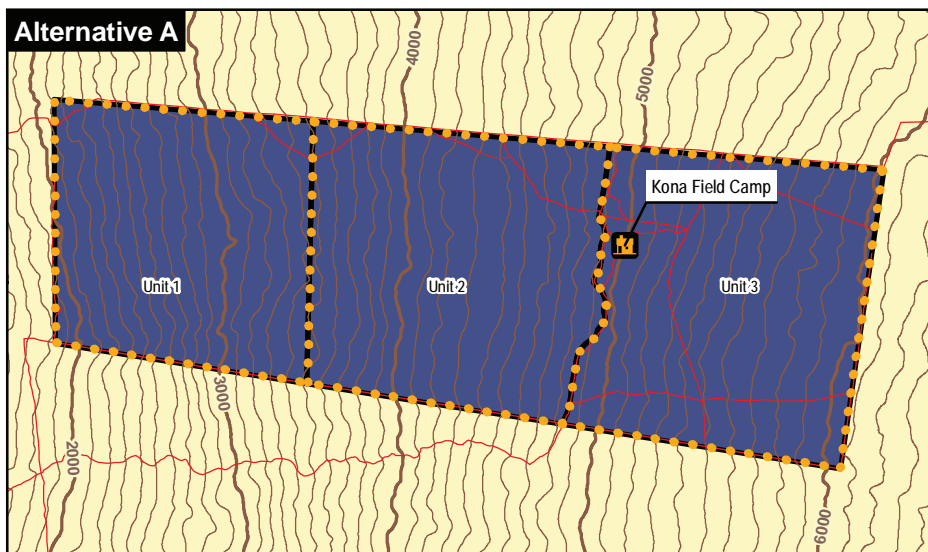
Contour Line (100')

Index Contour Line (1000')

Road

Produced by USFWS Region 1  
Refuge Information Branch  
Portland, Oregon  
Map Date: 7/27/2010  
File: 10-118-1





**LEGEND**

Existing Management Units

Management Action

Natural Restoration

Reforest and Restore

Survey & Monitor

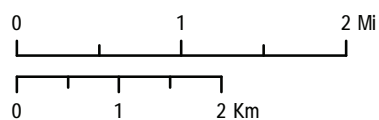
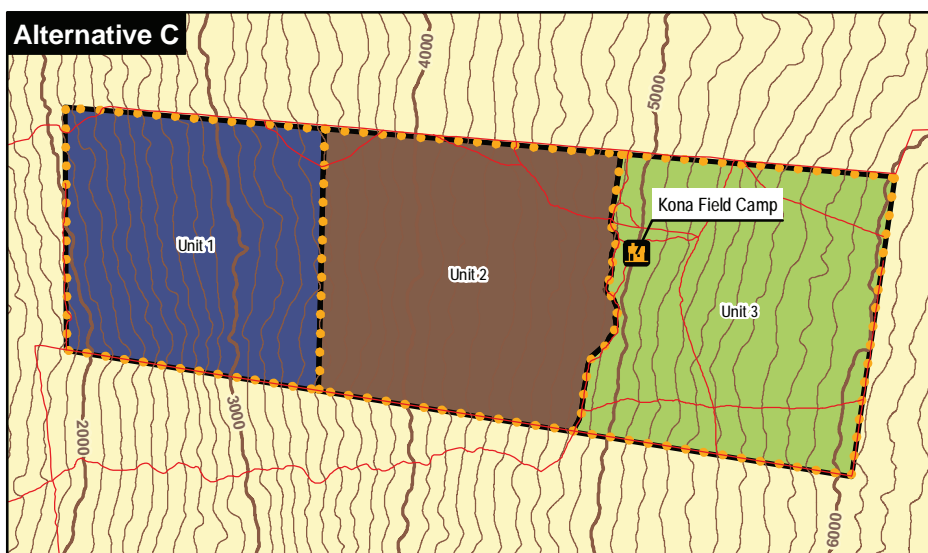
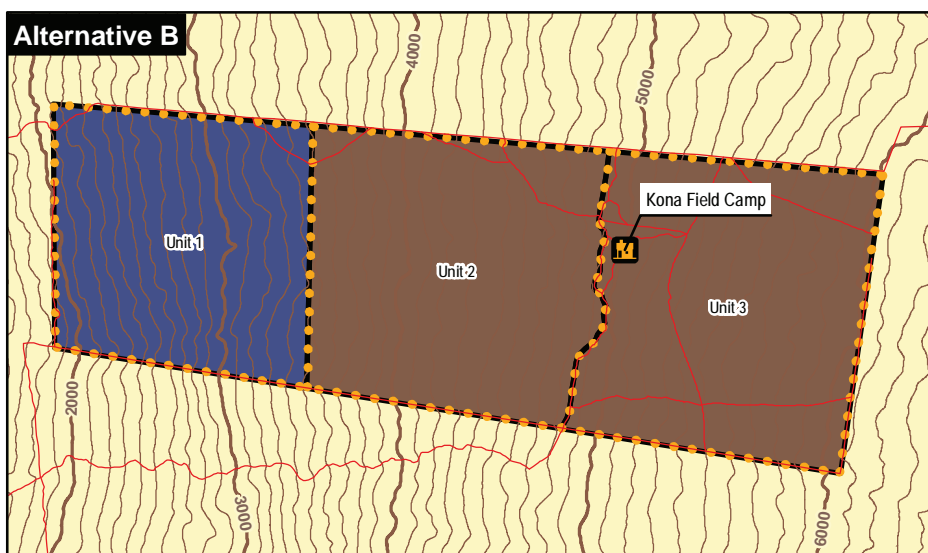
Camp

Proposed Fencing

Contour Line (100')

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Road



Produced by USFWS Region 1  
 Refuge Information Branch  
 Portland, Oregon  
 Map Date: 7/28/2010  
 File: 10-118-2







**Hakalau Forest National Wildlife Refuge**  
**60 Nowelo Street, Suite 100**  
**Hilo, HI 96720**

**Visit the Refuge's website at <http://www.fws.gov/hakalauforest/>**

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**We want to hear from you; your comments are important to us!**

**Send your comments to us by any of the following methods:**

**Mail:** Jim Kraus, Refuge Manager  
Hakalau Forest National Wildlife Refuge  
60 Nowelo Street, Suite 100,  
Hilo, HI 96720

**Phone:** 808-443-2300 **Fax:** 808-443-2304

**E-mail:** [FW1PlanningComments@fws.gov](mailto:FW1PlanningComments@fws.gov)  
(Please use Hakalau Refuge in the subject.)

**Visit our website at <http://www.fws.gov/hakalauforest/>  
and click on Refuge Planning for details on the  
comment period and the date, time, and location of the  
public open house meeting.**